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10/815,895

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EXAMINER

MCLEOD, MARSHALL M

ART UNIT

PAPER NUMBER

4152

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/815,895

Applicant(s)

VASUDEVAN ET AL.

Examiner

MARSHALL MCLEOD

Art Unit

4152

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/02)
Paper No(s)/Mail Date 30 November 2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-26 are pending in this application.

Claim Objections

2. Claim 4 is objected to because of the following informalities: “wherein said performing one or more operations”. The sentence structure does not make clear what applicant is trying to convey. Appropriate correction is required. Examiner will assume that applicant meant for the missing terms (TCP-A driver) to be placed between the words said (TCP-A driver) performing.
3. Claim 5 is objected to because of the following informalities: It recites the exact limitations as claim 4. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 6-12, 14-16, 18-19 and 23-26 are rejected as being unpatentable over Pettet (Pub. No US 2003/0014544 A1) in view of Hendel et al. (Pub. No US 2004/0013117 A1), hereinafter Hendel.

6. With respect to claim 1, Pettet discloses a “TCP-A (transport control protocol - accelerated) driver” (Page 10, [0089], lines 1-9; i.e. ... “a connection acceleration driver that is connected to a server's TCP/IP stack”). Pettet does not disclose,

- a. receiving an indication on a network component that one or more packets have been received from a network;
- b. the network component notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived;
- c. a TCP-A driver performing packet processing for at least one of the one or more packets; and
- d. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer.

However, Hendel discloses,

- a. receiving an indication on a network component that one or more packets have been received from a network (Page 2, [0025], lines 3-4; i.e. “NIC card receives packets from a network”);

- b. the network component notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing.");
- c. a TCP-A driver performing packet processing for at least one of the one or more packets (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing."); and
- d. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer (Page 3, [0035], lines 8-10; Page 5, [0072], lines 1-3; Page 6, [0091], lines 1-10).

It would have been obvious to a person skilled in the art at the time of the invention to modify the teachings of Pettey with the teachings of Hendel in order to accelerate selecting a connection while reducing the packet processing time.

7. With respect to claim 10, Pettey discloses a "TCP-A (transport control protocol - accelerated) driver" (Page 10, [0089], lines 1-9; i.e. ... "a connection acceleration driver that is connected to a server's TCP/IP stack"). Pettey does not disclose,
- a. A network component capable of:
 - b. receiving an indication on a network component that one or more packets have been received from a network;
 - c. notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived;

- d. a TCP-A driver capable of: performing packet processing for at least one of the one or more packets; and
- e. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer.

However, Hendel discloses,

- a. A network component capable of (Page 2, [0025], lines 3-4; i.e. "NIC card");
- b. receiving an indication on a network component that one or more packets have been received from a network (Page 2, [0025], lines 3-4; i.e. "NIC card receives packets from a network");
- c. notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing.");
- d. a TCP-A driver performing packet processing for at least one of the one or more packets (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing."); and
- e. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer (Page 3, [0035], lines 8-10; Page 5, [0072], lines 1-3; Page 6, [0091], lines 1-10).

It would have been obvious to a person skilled in the art at the time of the invention to modify the teachings of Pettey with the teachings of Hendel in order to accelerate selecting a connection while reducing the packet processing time.

8. With respect to claim 14, Pettey discloses a chipset having a DMA (direct memory access) engine, the chipset communicatively coupled to a TCP-A (Transport Control Protocol - Accelerated) (Page 10, [0089], lines 1-9; i.e. ... “a connection acceleration driver that is connected to a server's TCP/IP stack”) driver of a processor and to a network component (Page 2, [0016], lines 9-14); Pettey does not disclose,

- a. A network component capable of:
- b. receiving an indication on a network component that one or more packets have been received from a network;
- c. notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived;
- d. a TCP-A driver capable of: performing packet processing for at least one of the one or more packets; and
- e. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer.

However, Hendel discloses,

- a. A network component capable of (Page 2, [0025], lines 3-4; i.e. “NIC card”):

- b. receiving an indication on a network component that one or more packets have been received from a network (Page 2, [0025], lines 3-4; i.e. "NIC card receives packets from a network");
- c. notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing.");
- d. a TCP-A driver performing packet processing for at least one of the one or more packets (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing."); and
- e. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer (Page 3, [0035], lines 8-10; Page 5, [0072], lines 1-3; Page 6, [0091], lines 1-10).

It would have been obvious to a person skilled in the art at the time of the invention to modify the teachings of Pettey with the teachings of Hendel in order to accelerate selecting a connection while reducing the packet processing time.

9. With respect to claim 18, Pettey discloses a "TCP-A (transport control protocol - accelerated) driver" (Page 10, [0089], lines 1-9; i.e. ... "a connection acceleration driver that is connected to a server's TCP/IP stack"). Pettey does not disclose,
- a. A machine-readable medium having stored thereon instructions

- b. receiving an indication on a network component that one or more packets have been received from a network;
- c. the network component notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived;
- d. a TCP-A driver performing packet processing for at least one of the one or more packets; and
- e. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer.

However, Hendel discloses,

- a. A machine-readable medium having stored thereon instructions (Claim 30, i.e. a computer readable storage medium storing instructions),
- b. receiving an indication on a network component that one or more packets have been received from a network (Page 2, [0025], lines 3-4; i.e. "NIC card receives packets from a network");
- c. the network component notifying a TCP-A (transport control protocol - accelerated) driver that the one or more packets have arrived (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing.");
- d. a TCP-A driver performing packet processing for at least one of the one or more packets (Page 2, [0025], lines 7-8; i.e. "forward the headers to a host for protocol processing."); and

- e. the TCP-A driver performing one or more operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer (Page 3, [0035], lines 8-10; Page 5, [0072], lines 1-3; Page 6, [0091], lines 1-10).

It would have been obvious to a person skilled in the art at the time of the invention to modify the teachings of Pettey with the teachings of Hendel in order to accelerate selecting a connection while reducing the packet processing time.

10. With respect to claim 2, it is rejected for the same reasons as claim 1 above. In addition, Hendel discloses splitting each of the one or more packets into a header and a payload (Page 2, [0025], lines 4-5); and posting each of the header and payload to one or more post buffers (Page 2, [0025], lines 4-8).

11. With respect to claim 6, it is rejected for the same reasons as claim 1 above. In addition, Hendel discloses the data movement module comprises a DMA (direct memory access) engine (Page 2, [0029], lines 1-5; i.e. receiving packet payloads from the communication interface via DMA).

12. With respect to claim 7, it is rejected for the same reasons as claim 6 above. In addition, Hendel discloses the DMA engine resides on a chipset (Page 2, [0030], lines 1-9; i.e. other input/output interfaces that provide DMA capability may be applied).

13. With respect to claim 8, it is rejected for the same reasons as claim 6 above. In addition Hendel discloses the DMA engine resides on a host processor as a support module (Figure 1, Host 140, RDMA buffer(s) 144; Page 2, [0029], lines 1-5; i.e. each host also includes any number of buffers (144, 154).

14. With respect to claim 9, Pettey discloses receiving a request on an operating system to transmit data over the network (Page 5, [0054], lines 1-18); the operating system notifying the TCP-A driver that there is data to be transmitted (Page 12, [0107], lines 6-12); the TCP-A driver performing one or more operations that result in the data being transmitted to the network component (Page 12, [0105], lines 1-11); in response to receiving the data, the network component creating one or more packets for transmission by packetizing the data (Page 17, [0136] lines 13-30); and the network component transmitting the one or more packets over the network (Page 17, [0136] lines 13-30).

15. With respect to claim 11, Pettey discloses receiving a request to transmit data over the network (Page 5, [0054], lines 1-18); and notifying the TCP-A driver that data is ready to be transmitted (Page 12, [0107], lines 6-12); wherein: the TCP-A driver is capable of performing one or more operations that result in the data being transmitted to the network component (Page 12, [0105], lines 1-11); and the network component is capable of: creating one or more packets for transmission by packetizing the data in response to receiving the data (Page 17, [0136] lines 13-30); and transmitting the one or more packets over the network (Page 17, [0136] lines 13-30).

16. With respect to claim 12, it is rejected for the same reasons as claim 10 above. In addition, Hendel discloses wherein in response to receiving an indication on a network component that one or more packets have been received from the network (Page 2, [0025], lines 3-4; i.e. "NIC card receives packets from a network"), the network component is additionally capable of: splitting each of the one or more packets into a header and a payload (Page 2, [0025], lines 4-5); and posting each of the header and payload to one or more post buffers (Page 2, [0025], lines 4-8).

17. With respect to claim 15, Pettey discloses receiving a request to transmit data over the network (Page 5, [0054], lines 1-18); and notifying the TCP-A driver that data is ready to be transmitted (Page 12, [0107], lines 6-12); wherein: the TCP-A driver is capable of performing one or more operations that result in the data being transmitted to a network component (Page 12, [0105], lines 1-11); and the network component is capable of: creating one or more packets for transmission by packetizing the data in response to receiving the data (Page 17, [0136] lines 13-30); and transmitting the one or more packets over the network (Page 17, [0136] lines 13-30).

18. With respect to claim 16, it is rejected for the same reasons as claim 14 above. In addition, Hendel discloses wherein in response to receiving an indication on a network component that one or more packets have been received from the network (Page 2, [0025], lines 3-4; i.e. "NIC card receives packets from a network"), the network component is additionally capable of: splitting each of the one or more packets into a header and a payload (Page 2, [0025],

lines 4-5); and posting each of the header and payload to one or more post buffers (Page 2, [0025], lines 4-8).

19. With respect to claim 19, it is rejected for the same reasons as claim 18 above. In addition, Hendel discloses splitting each of the one or more packets into a header and a payload (Page 2, [0025], lines 4-5); and posting each of the header and payload to one or more post buffers (Page 2, [0025], lines 4-8).

20. With respect to claim 23, it is rejected for the same reasons as claim 18 above. In addition, Hendel discloses the data movement module comprises a DMA (direct memory access) engine (Page 2, [0029], lines 1-5; i.e. receiving packet payloads from the communication interface via DMA).

21. With respect to claim 24, it is rejected for the same reasons as claim 23 above. In addition, Hendel discloses the DMA engine resides on a chipset (Page 2, [0030], lines 1-9; i.e. other input/output interfaces that provide DMA capability may be applied).

22. With respect to claim 25, it is rejected for the same reasons as claim 23 above. In addition Hendel discloses the DMA engine resides on a host processor as a support module (Figure 1, Host 140, RDMA buffer(s) 144; Page 2, [0029], lines 1-5; i.e. each host also includes any number of buffers (144, 154)).

23. With respect to claim 26, it is rejected for the same reasons as claim 18 above. In addition, Pettey discloses receiving a request on an operating system to transmit data over the network (Page 5, [0054], lines 1-18); the operating system notifying the TCP-A driver that there is data to be transmitted (Page 12, [0107], lines 6-12); the TCP-A driver performing one or more operations that result in the data being transmitted to the network component (Page 12, [0105], lines 1-11); in response to receiving the data, the network component creating one or more packets for transmission by packetizing the data (Page 17, [0136] lines 13-30); and the network component transmitting the one or more packets over the network (Page 17, [0136] lines 13-30).

24. Claims 4-5, and 21-22 are rejected as being unpatentable over Pettey (Pub. No US 2003/0014544 A1) in view of Hendel et al. (Pub. No US 2004/0013117 A1), hereinafter Hendel, as applied to claims 1 and 18 above, and further in view of Cheriton et al. (Patent No US 6,675,200 B1), hereinafter Cheriton.

25. With respect to claim 4, it rejected for the same reasons as claim 1 above. In addition, neither Pettey or Hendel discloses operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer comprises sending a request to a data movement module driver to write the one or more corresponding payloads to the read buffer. However, Cheriton discloses operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer comprises sending a request to a data movement module

driver to write the one or more corresponding payloads to the read buffer (Column 8, lines 29-31).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Pettey combined with Hendel, with the teachings of Cheriton in order to achieve faster data movement.

26. With respect to claim 5, it is rejected for the same reasons as claim 4 above.

27. With respect to claim 21, it rejected for the same reasons as claim 18 above. In addition, neither Pettey or Hendel discloses operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer comprises sending a request to a data movement module driver to write the one or more corresponding payloads to the read buffer. However, Cheriton discloses operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer comprises sending a request to a data movement module driver to write the one or more corresponding payloads to the read buffer (Column 8, lines 29-31).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Pettey combined with Hendel, with the teachings of Cheriton in order to achieve faster data movement.

28. With respect to claim 22, it rejected for the same reasons as claim 18 above. In addition, neither Pettey or Hendel discloses operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer comprises sending a request to a data movement module driver to write the one or more corresponding payloads to the read buffer. However, Cheriton discloses operations that result in a data movement module placing one or more corresponding payloads of the at least one of the one or more packets into a read buffer comprises sending a request to a data movement module driver to write the one or more corresponding payloads to the read buffer (Column 8, lines 29-31).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Pettey combined with Hendel, with the teachings of Cheriton in order to achieve faster data movement.

29. Claims 13, 17, and 20 are rejected as being unpatentable over Pettey (Pub. No US 2003/0014544 A1) in view of Hendel et al. (Pub. No US 2004/0013117 A1), hereinafter Hendel, as applied to claims 12, 16, and 19 above, and further in view of Seidl et al. (Pub. No US 2003/0217231 A1), hereinafter Seidl.

30. With respect to claim 13, 17, and 20, the combination of Pettey and Hendel discloses wherein the TCP-A driver performs packet processing by processing each of the headers (Hendel, Page 4, [0054], lines 1-6; i.e. the interface may parse any or all of the layer headers). The combination of Pettey and Hendel does not disclose that the TCP-A driver is additionally

capable of fetching a next header of the one or more headers prior to completing the processing of the current header. However, Seidl discloses that the TCP-A driver is additionally capable of fetching a next header of the one or more headers prior to completing the processing of the current header (Page 1, [0017], lines 1-4; i.e. Note that this may involve prefetching a header...). It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Pettey combined with Hendel, with the teachings of Seidl in order to speed up the transfer of data by reducing the time it takes to fetch the data.

Conclusion

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARSHALL MCLEOD whose telephone number is (571)270-3808. The examiner can normally be reached on Monday - Friday 7:30 a.m-5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nabil El-Hady can be reached on (571) 272-3963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

M.M. 1/4/2008

/Nabil El-Hady, Ph.D, M.B.A./
Supervisory Patent Examiner, Art Unit 4152